

Patent
52478-3600**IN THE CLAIMS:**

1-39. (Cancelled)

40. (Previously Presented) A broadcasting apparatus that broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting apparatus comprising:

an allotment unit operable to allot a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission unit operable in accordance with the result of allotment by the allotment unit, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment unit sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time,

the allotment unit (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period; and

a cache instruction message unit operable to repeatedly transmitting a cache instruction message at a time interval that is not longer than a transmission period of the program

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data of the specific program before the starting time of the reproduction time period of the specific program,

wherein the cache instruction message unit instructs the receiving apparatus to cache the received program data of the specific program.

41. (Previously Presented) A broadcasting apparatus that broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting apparatus comprising:

an allotment unit operable to allot a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission unit operable in accordance with the result of allotment by the allotment unit, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment unit sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

the allotment unit (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

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a table data transmission unit operable to transmit table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and instruction IDs that are assigned for the instructions;

a first message transmission unit operable to transmit a first message before the starting time of the reproduction time period of the specific program, wherein the first message consists of an instruction ID that identifies the cache instruction and a program ID that identifies the program data of the specific program;

a second message transmission unit operable to transmit a second message at the starting time of the reproduction period of the specific program, wherein the second message consists of an instruction ID that identifies the reproduction instruction and a program ID that identifies the program data of the specific program; and

a third message transmission unit operable to transmit a third message at the finishing time of the reproduction time period of the specific program, wherein the third message consists of an instruction ID that identifies the deletion instruction and a program ID that identifies the program data of the specific program.

42. (Previously Presented) A broadcasting apparatus that broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting apparatus comprising:

an allotment unit operable to allot a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

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a transmission unit operable in accordance with the result of allotment by the allotment unit, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment unit sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

the allotment unit (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

a table data transmission unit operable to transmit table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and data IDs for identifying the instructions;

a first data transmission unit operable to transmit a first data before the starting time of the reproduction time period of the specific program, wherein the first data has a data ID which identifies the cache instruction as an instruction to be executed by the receiving apparatus;

a second data transmission unit operable to transmit a second data at the starting time of the reproduction time period of the specific program, wherein the second data has a data ID which identifies the reproduction instruction as an instruction to be executed by the receiving apparatus; and

a third data transmission unit operable to transmit a third data at the finishing time of the reproduction time period of the specific program, wherein the third data has a data ID

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which identifies the deletion instruction as an instruction to be executed by the receiving apparatus.

43. (Cancelled)

44. (Previously Presented) A broadcasting method for broadcasting a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting method comprising:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time,

the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period; and

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a cache instruction message step for repeatedly transmitting a cache instruction message at a time interval that is not longer than a transmission period of the program data of the specific program before the starting time of the reproduction time period of the specific program,

wherein the cache instruction message step instructs the receiving apparatus to cache the received program data of the specific program.

45. (Previously Presented) A program recording medium which is readable by a computer in a broadcasting apparatus, the broadcast apparatus broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, a computer program embodied on the program recording medium has the computer conduct the steps of:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined

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broadcasting to the specific program from the second time to the finishing time of the reproduction time period; and

a cache instruction message step for repeatedly transmitting a cache instruction message at a time interval that is not longer than a transmission period of the program data of the specific program before the starting time of the reproduction time period of the specific program,

wherein the cache instruction message step instructs the receiving apparatus to cache the received program data of the specific program.

46. (Cancelled)

47. (Previously Presented) A broadcasting method for broadcasting a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting method comprising:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step for, in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

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the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

a table data transmission step for transmitting table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and instruction IDs that are assigned for the instructions;

a first message transmission step for transmitting a first message before the starting time of the reproduction time period of the specific program, wherein the first message consists of an instruction ID that identifies the cache instruction and a program ID that identifies the program data of the specific program;

a second message transmission step for transmitting a second message at the starting time of the reproduction period of the specific program, wherein the second message consists of an instruction ID that identifies the reproduction instruction and a program ID that identifies the program data of the specific program; and

a third message transmission step for transmitting a third message at the finishing time of the reproduction time period of the specific program, wherein the third message consists of an instruction ID that identifies the deletion instruction and a program ID that identifies the program data of the specific program.

48. (Previously Presented) A program recording medium which is readable by a computer in a broadcasting apparatus, the broadcast apparatus broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the

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reproduction being performed by a receiving apparatus, a computer program embodied in the program recording medium has the computer conduct the steps of:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step for, in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

a table data transmission step for transmitting table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and instruction IDs that are assigned for the instructions;

a first message transmission step for transmitting a first message before the starting time of the reproduction time period of the specific program, wherein the first message

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consists of an instruction ID that identifies the cache instruction and a program ID that identifies the program data of the specific program;

a second message transmission step for transmitting a second message at the starting time of the reproduction period of the specific program, wherein the second message consists of an instruction ID that identifies the reproduction instruction and a program ID that identifies the program data of the specific program; and

a third message transmission step for transmitting a third message at the finishing time of the reproduction time period of the specific program, wherein the third message consists of an instruction ID that identifies the deletion instruction and a program ID that identifies the program data of the specific program.

49. (Cancelled)

50. (Previously Presented) A broadcasting method for broadcasting a specific program to which a reproduction time period between a starting time and a finishing time is specified, the reproduction being performed by a receiving apparatus, the broadcasting apparatus comprising:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step, in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

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wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

a table data transmission step for transmitting table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and data IDs for identifying the instructions;

a first data transmission step for transmitting a first data before the starting time of the reproduction time period of the specific program, wherein the first data has a data ID which identifies the cache instruction as an instruction to be executed by the receiving apparatus;

a second data transmission step for transmitting a second data at the starting time of the reproduction time period of the specific program, wherein the second data has a data ID which identifies the reproduction instruction as an instruction to be executed by the receiving apparatus; and

a third data transmission step for transmitting a third data at the finishing time of the reproduction time period of the specific program, wherein the third data has a data ID which identifies the deletion instruction as an instruction to be executed by the receiving apparatus.

51. (Previously Presented) A program record medium which is readable by a computer in a broadcasting apparatus, the broadcast apparatus broadcasts a specific program to which a reproduction time period between a starting time and a finishing time is specified, the

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reproduction being performed by a receiving apparatus, a computer program embodied in the program recording medium has the computer conduct the steps of:

an allotment step for allotting a broadcasting bandwidth for the reproduction time period to the specific program and allotting a part of the broadcasting bandwidth for a preceding time period immediately before the reproduction time period to the specific program and the other part of the broadcasting bandwidth to another program;

a transmission step, in accordance with the result of allotment by the allotment step, for (a) repeatedly transmitting program data of the other program while transmitting program data of the specific program in the preceding time period, and (b) repeatedly transmitting the program data of the specific program in the reproduction time period,

wherein the allotment step sets a starting time of the preceding time period as a first time and a time included in between the first time and the starting time of the reproduction time period as a second time, and

the allotment step (a) allots a broadcasting bandwidth not broader than a predetermined broadcasting bandwidth to the specific program from the first time to the second time, and (b) allots a broadcasting bandwidth broader than the predetermined broadcasting to the specific program from the second time to the finishing time of the reproduction time period;

a table data transmission step for transmitting table data before the starting time of the reproduction time period of the specific program, wherein the table data includes information on correspondences between instructions to cache, reproduce, and delete the program data of the specific program and data IDs for identifying the instructions;

a first data transmission step for transmitting a first data before the starting time of the reproduction time period of the specific program, wherein the first data has a data ID which identifies the cache instruction as an instruction to be executed by the receiving apparatus;

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a second data transmission step for transmitting a second data at the starting time of the reproduction time period of the specific program, wherein the second data has a data ID which identifies the reproduction instruction as an instruction to be executed by the receiving apparatus; and

a third data transmission step for transmitting a third data at the finishing time of the reproduction time period of the specific program, wherein the third data has a data ID which identifies the deletion instruction as an instruction to be executed by the receiving apparatus.

52-55. (Cancelled)

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